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FLOOD INSURANCE STUDY

VILLAGE OF DARBYVILLE, OHIO

PICKAWAY COUNTY

AUGUST 16, 1988

ORIGINAL

Federal Emergency Management Agency

COMMUNITY NUMBER 390712

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FLOOD INSURANCE STUDY

VILLAGE OF DARBYVILLE,
PICKAWAY COUNTY,
OHIO

1.0 INTRODUCTION

1.1 Purpose of Study

This Flood Insurance Study investigates the existence and severity of flood hazards in the Village of Darbyville, Pickaway County, Ohio, and aids in the administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. This study has developed flood risk data for various areas of the community that will be used to establish actuarial flood insurance rates and assist the community in its efforts to promote sound floodplain management. Minimum floodplain management requirements for participation in the National Flood Insurance Program are set forth in the Code of Federal Regulations at 44 CFR, 60.3.

In some states or communities, floodplain management criteria or regulations may exist that are more restrictive or comprehensive than the minimum Federal requirements. In such cases, the more restrictive criteria take precedence and the state (or other jurisdictional agency) will be able to explain them.

1.2 Authority and Acknowledgments

The sources of authority for this Flood Insurance Study are the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973.

The hydrologic and hydraulic analyses for this study were performed by the U.S. Geological Survey (USGS), Water Resources Division, (the Study Contractor) for the Federal Emergency Management Agency (FEMA), under Inter-Agency Agreement No. EMW-85-E-1823, Project Order No. 18. This study was completed in September 1986.

1.3 Coordination

On March 25, 1985, an initial meeting was held with representatives of FEMA; the Ohio Department of Natural Resources, Division of Water; the Village of Darbyville; and the Study Contractor. Coordination with town officials and Federal and State agencies produced a variety of information pertaining to floodplain regulations, community maps, flood history, and other hydrologic data.

On September 14, 1987, the results of this Flood Insurance Study were reviewed and accepted at a final coordination meeting attended by representatives of the Study Contractor, FEMA, and the community.

2.0 AREA STUDIED

2.1 Scope of Study

This Flood Insurance Study covers the incorporated area of the Village of Darbyville, Pickaway County, Ohio. The area of study is shown on the Vicinity Map (Figure 1).

Flooding caused by overflow of Big Darby Creek was studied in detail within the community.

Approximate analyses were used to study those areas having a low development potential or minimal flood hazards.

The areas studied were selected with priority given to all known flood hazard areas and areas of projected development or proposed construction through September 1991. The scope and methods of study were proposed to and agreed upon by FEMA and the Village of Darbyville.

2.2 Community Description

The Village of Darbyville is in north-central Pickaway County, Ohio, approximately 20 miles south of the City of Columbus, Ohio, and is surrounded by the unincorporated areas of the county. Darbyville is served by State Route 316. The 1980 population of Darbyville was reported to be 282 (Reference 1).

The average annual precipitation of the study area is 37 inches and is fairly uniformly distributed throughout the year (Reference 2).

Big Darby Creek and its tributary, Lizard Run, are the primary watercourses affecting the Village of Darbyville.

2.3 Principal Flood Problems

The low-lying areas adjacent to Big Darby Creek within the Village of Darbyville are subject to periodic flooding. The most extensive flooding in Darbyville occurred in March 1913 and January 1959. There is no record of the magnitude of the 1913 flood discharge. The flood discharge of the 1959 event was determined by a contracted-opening measurement at the State Route 316 bridge to be 49,000 cubic feet per second (cfs). The recurrence interval of the 1959 event is estimated to be slightly more than 500 years.

2.4 Flood Protection Measures

Flood protection measures are not known to exist within the study area.

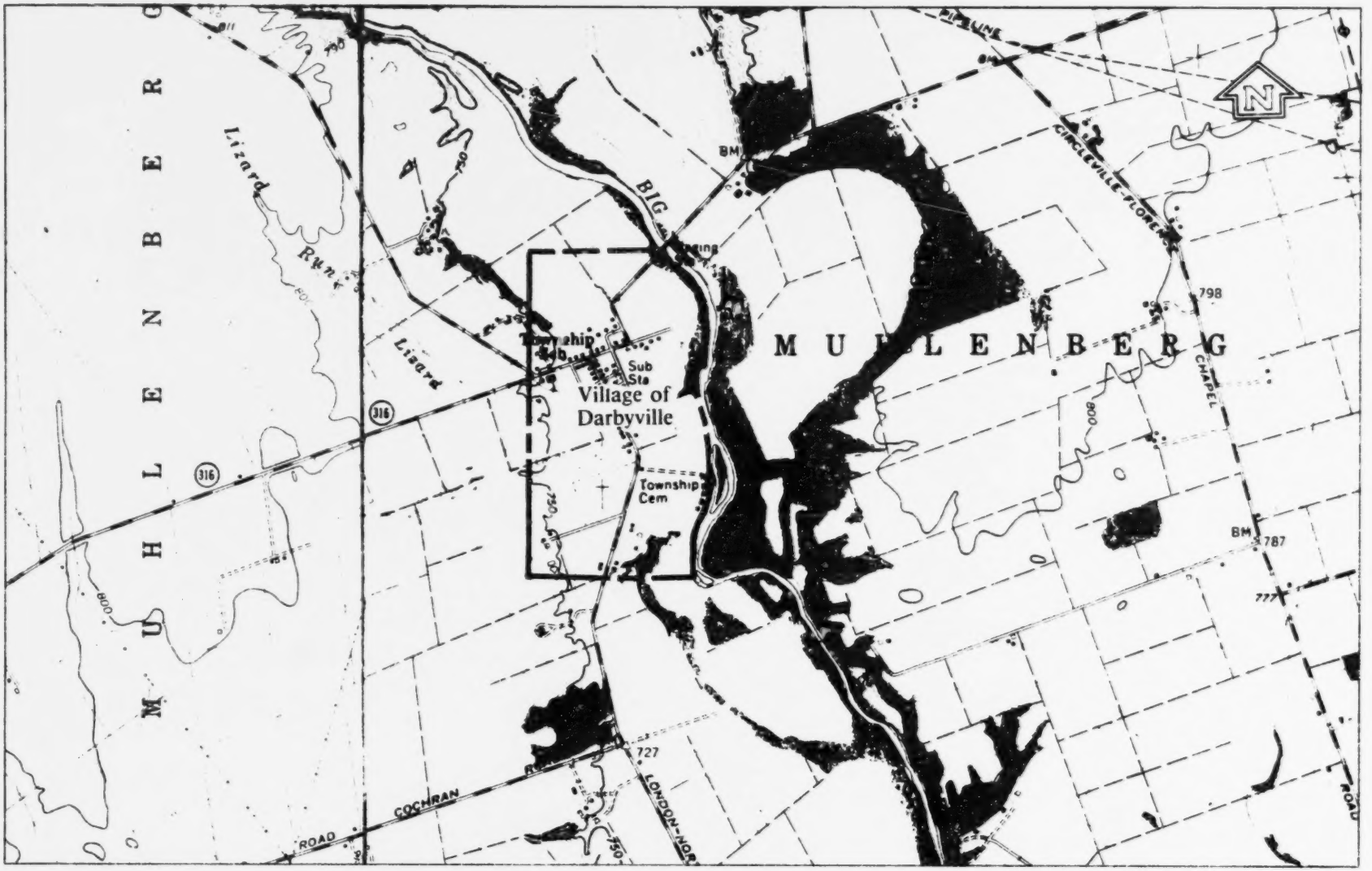


FIGURE 1

FEDERAL EMERGENCY MANAGEMENT AGENCY

VILLAGE OF DARBYVILLE, OH
(PICKAWAY CO.)

APPROXIMATE SCALE
2000 0 2000 4000 6000 FEET

VICINITY MAP

3.0 ENGINEERING METHODS

For the flooding sources studied in detail in the community, standard hydrologic and hydraulic study methods were used to determine the flood hazard data required for this study. Flood events of a magnitude that are expected to be equaled or exceeded once on the average during any 10-, 50-, 100-, or 500-year period (recurrence interval) have been selected as having special significance for floodplain management and for flood insurance rates. These events, commonly termed the 10-, 50-, 100-, and 500-year floods, have a 10, 2, 1, and 0.2 percent chance, respectively, of being equaled or exceeded during any year. Although the recurrence interval represents the long-term average period between floods of a specific magnitude, rare floods could occur at short intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than 1 year are considered. For example, the risk of having a flood that equals or exceeds the 100-year flood (1 percent chance of annual exceedence) in any 50-year period is approximately 40 percent (4 in 10), and, for any 90-year period, the risk increases to approximately 60 percent (6 in 10). The analyses reported herein reflect flooding potentials based on conditions existing in the community at the time of completion of this study. Maps and flood elevations will be amended periodically to reflect future changes.

3.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish the peak discharge-frequency relationships for each riverine flooding source studied in detail affecting the community.

A log-Pearson Type III flood frequency analysis was performed on peak-flow data from the USGS stream gage of Big Darby Creek in Darbyville. The flood-frequency analysis was performed on 62 years of systematic record (1922-1984) and then modified to extend the record to include the period from 1913 to 1922 to compute a historically adjusted frequency curve.

Water Resources Council Bulletin No. 17B (Reference 3) recommends the use of maximum peaks that have occurred before, during, or after the systematic record in the computation of the frequency curve.

The peak discharge-drainage area relationship for the 100-year flood of each flooding source studied in detail in the community is shown in Table 1.

TABLE 1 - SUMMARY OF DISCHARGES

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (SQ MILES)	PEAK DISCHARGE (CFS) 100-YEAR
BIG DARBY CREEK		
at State Route 316	534	32,600

3.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of flooding from the sources studied were carried out to provide estimates of the elevations of floods of the selected recurrence intervals.

A field survey was conducted to determine the water-surface slope for Big Darby Creek.

The water-surface elevation of the 100-year flood discharge was determined at the USGS gaging station. The water-surface slope data obtained from the field survey was then used to estimate the 100-year water-surface elevations throughout the Village of Darbyville. This method assumes that the 100-year water-surface slope throughout Darbyville will approximate the water-surface slope at lower elevations.

Flood profiles were drawn showing the computed water-surface elevations for floods of the selected recurrence intervals.

The hydraulic analyses for this study are based on the effects of unobstructed flow. The flood elevations shown on the profiles are, thus, considered valid only if hydraulic structures remain unobstructed, operate properly, and do not fail.

All elevations are referenced to the National Geodetic Vertical Datum of 1929 (NGVD). Elevation reference marks used in this study are shown on the maps and described in the exhibit labeled Elevation Reference Marks.

4.0 FLOODPLAIN MANAGEMENT APPLICATIONS

The National Flood Insurance Program encourages state and local governments to adopt sound floodplain management programs. Therefore, each Flood Insurance Study provides 100-year flood elevations and delineations of the 100- and 500-year floodplain boundaries and 100-year floodway to assist communities in developing floodplain management measures.

4.1 Flood Boundaries

To provide a national standard without regional discrimination, the 1-percent annual chance (100-year) flood has been adopted by FEMA as the base flood for floodplain management purposes. The 0.2 percent annual chance (500-year) flood is employed to indicate additional areas of flood risk in the community. For each stream studied in detail, the 100- and 500-year floodplain boundaries have been delineated using the flood elevations determined at each cross section. Between cross sections, the boundaries were interpolated using topographic maps at a scale of 1:24000 with a contour interval of 10 feet (Reference 4).

The 100-year floodplain boundary is shown on the Flood Insurance Rate Map. On this map, the 100-year floodplain boundary corresponds to the boundary of the areas of special flood hazards (Zones A, AE, AH, AO, A99, V).

Floodway Map. Small areas within the floodplain boundaries may lie above the flood elevations but cannot be shown due to limitations of the map scale and/or lack of detailed topographic data.

For the streams studied by approximate methods, only the 100-year floodplain boundary was delineated using the Flood Hazard Boundary Map for the Village of Darbyville, Ohio (Reference 5).

4.2 Floodways

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 100-year flood can be carried without substantial increases in flood heights.

Floodways have not been shown or computed for this community. Along streams where floodways have not been computed, the community must ensure that the cumulative effect of development in the floodplain will not cause more than a 1.0-foot increase in the base flood elevations at any point within the community.

5.0 INSURANCE APPLICATION

For flood insurance rating purposes, flood insurance zone designations are assigned to a community based on the results of the engineering analyses. These zones are as follows:

Zone A

Zone A is the flood insurance rate zone that corresponds to the 100-year floodplains that are determined in the Flood Insurance Study by approximate methods. Because detailed hydraulic analyses are not performed for such areas, no base flood elevations or depths are shown within this zone.

Zone AE

Zone AE is the flood insurance rate zone that corresponds to the 100-year floodplains that are determined in the Flood Insurance Study by detailed methods. Whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone X

Zone X is the flood insurance rate zone that corresponds to areas outside the 100-year floodplain, areas of 100-year flooding where average depths are less than 1 foot, areas of 100-year flooding where the contributing drainage area is less than 1 square mile, and areas protected from the 100-year flood by levees. No base flood elevations or depths are shown within this zone.

6.0 FLOOD INSURANCE RATE MAP

The Flood Insurance Rate Map is designed for flood insurance and floodplain management applications.

For flood insurance applications, the map designates flood insurance rate zones as described in Section 5.0 and, in the 100-year floodplains that were studied by detailed methods, shows selected whole-foot base flood elevations in conjunction with information on structures and their contents to assign premium rates for flood insurance policies.

For floodplain management applications, the map shows by tints, screens, and symbols the 100- and 500-year floodplains, the floodways, and the locations of selected cross sections used in the hydraulic analyses and floodway computations.

7.0 OTHER STUDIES

Due to its more detailed analysis, this Flood Insurance Study supersedes the previously printed Flood Hazard Boundary Map for the Village of Darbyville (Reference 5).

8.0 LOCATION OF DATA

Information concerning the pertinent data used in the preparation of this study can be obtained by contacting the Natural and Technological Hazards Division, FEMA, 300 South Wacker Drive, Chicago, Illinois 60606.

9.0 REFERENCES AND BIBLIOGRAPHY

1. U.S. Department of Commerce, Bureau of the Census, 1980 Census of Population, Number of Inhabitants, Ohio, Washington, D.C., February 1982.

2. Ohio Division of Water, Inventory Report No. 13, Hydrologic Atlas of Annual Precipitation, Temperature, Streamflow, and Water Loss in Ohio, 1962.

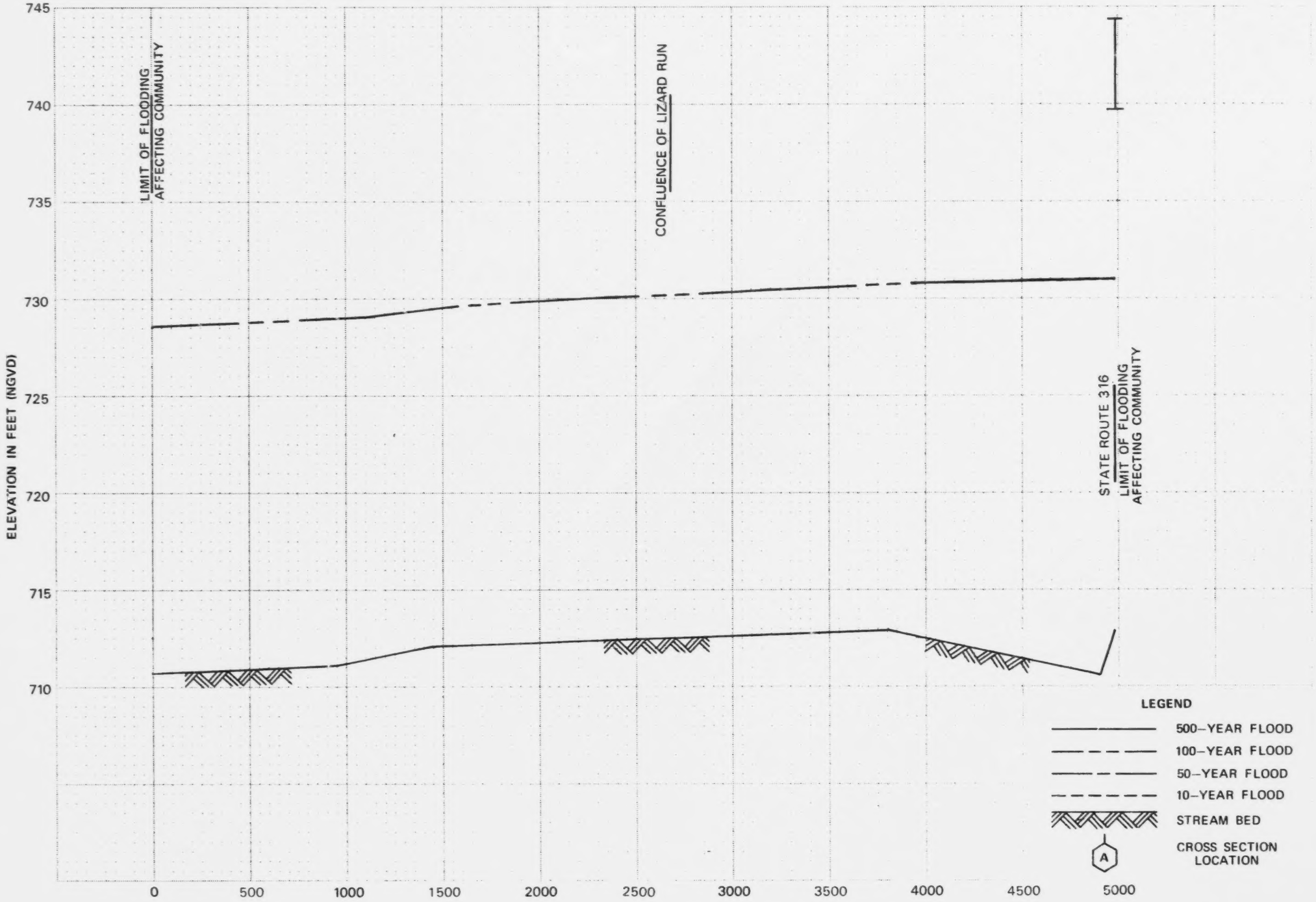
3. U.S. Department of the Interior, Geological Survey, Interagency Advisory Committee on Water Data, Office of Water Data Coordination, Hydrology Subcommittee, Bulletin No. 17B, Guidelines for Determining Flood Flow Frequency, September 1981, revised March 1982.

4. U.S. Geological Survey, 7.5 Minute Series Topographic Maps, Scale 1:24000, Contour Interval 10 Feet: Darbyville, Ohio, 1958, photorevised 1970.

5. U.S. Department of Housing and Urban Development, Federal Insurance Administration, Flood Hazard Boundary Map, Village of Darbyville, Pickaway County, Ohio, October 1978.

ELEVATION REFERENCE MARKS

REFERENCE MARK	FLOOD INSURANCE RATE MAP PANEL	ELEVATION (FEET NGVD)	DISCRIPTION OF LOCATION
1	0001	731.19	spike in first electric power pole west of State Route 316 bridge over Big Darby Creek
2	0001	740.86	top of bonnet bolt nearest roadway on fire hydrant located just east of intersection of East Street and Second Street
3	0001	740.95	top of bonnet bolt nearest roadway on fire hydrant located just west of intersection of Main Street and Fourth Street
4	0001	744.47	top of bonnet bolt nearest roadway on fire hydrant located on west side of Main Street in front of Darbyville Community Church
5	0001	722.31	northeast corner of concrete patio slab located on east side of shelter house at end of Greensway Road
6	0001	739.12	top of bonnet bolt nearest roadway on fire hydrant located just east of Main Street opposite Darbyville Church of the Nazarene



FLOOD PROFILES

BIG DARBY CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

VILLAGE OF DARBYVILLE, OH
(PICKAWAY CO.)

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